

Claims

- [c1] 1. A method of determining the leading edge (E) of an object (P) comprising:
mounting the object (P) in a desired position;
positioning a light source (S) on one side of the object and viewing the object and its leading edge with an imaging means (I) positioned on the opposite side of the object;
illuminating the object (P) with the light source (S), the object blocking a portion of the light from the light source (S) and the occluded portion of the light defining an outline (T) of the object including its leading edge (E);
obtaining an image of the object (P) with the imaging means (I);
moving the object (P) to a new position and repeating the above steps of illuminating the object (P) and obtaining an image of the object with the imaging means; and,
processing the images using space carving techniques to ascertain the contour of the leading edge of the object whereby an accurate measurement of the leading edge can be made.
- [c2] 2. The method of claim 1 further including comparing the leading edge measurements of the object (P) with a reference to determine whether or not the object is an acceptable object.
- [c3] 3. The method of claim 2 in which at least three separate images of the object (P) are obtained and processed in order to determine the contour of the leading edge.
- [c4] 4. The method of claim 1 further including using a plurality of imaging means (I) spaced apart from one another on the same side of the object;
obtaining a separate image of the object (P) from each imaging means (I); and,
processing the respective images using space carving techniques to ascertain the contour of the leading edge (E) of the object whereby an accurate measurement of the leading edge can be made.
- [c5] 5. The method of claim 4 in which the imaging means (I) comprises cameras and at least three cameras are used.

- [c6] 6. The method of claim 1 in which the object (P) is installed on a movable fixture (B) to orient the object in a desired position relative to the light source (S) and imaging means (I).
- [c7] 7. A method of determining the leading edge (E) of an object (P) comprising:
 mounting the object (P) in a desired position;
 positioning a light source (S) on one side of the object and a plurality of imaging means (I) on the opposite side of the object;
 illuminating the object (P) with the light source (S), the object (P) blocking a portion of the light from the light source (S) with the occluded portion of the light defining an outline (T) of the object (P) including its leading edge (E);
 obtaining an image of the object (P) with each of the respective imaging means (I); and,
 processing the respective images using space carving techniques to ascertain the contour (T) of the leading edge (E) of the object (P) whereby an accurate measurement of the leading edge (E) can be made.
- [c8] 8. The method of claim 7 wherein the imaging means (I) includes at least three cameras.
- [c9] 9. The method of claim 7 further including comparing the leading edge (E) measurements of the object (P) with a reference to determine whether or not the object is an acceptable object.
- [c10] 10. Apparatus for determining the leading edge (E) of an object (P) comprising:
 a (B) fixture on which the object (P) is mounted;
 a light source (S) positioned on one side of the object (P);
 a camera (I) positioned on the opposite of the object (P) for obtaining an image of the object (P) and its leading edge (E), the light source (S) illuminating the object which blocks a portion of the light from the light source (S) with the occluded portion of the light defining an outline (T) of the object (P) including its leading edge (E), and the object (P) being sequentially moved to new positions at each of which an image of the outline (T) of the object (P) including its leading edge (E) is obtained; and,
 a processor (R) processing the respective images using space carving

techniques to ascertain the contour of the leading edge of the airfoil whereby an accurate measurement of the leading edge of the airfoil can be made.

[c11] 11. The apparatus of claim 10 wherein the processor (R) compares the leading edge measurements of the airfoil (P) with a reference to determine whether or not the airfoil is an acceptable object.

[c12] 12. The apparatus of claim 10 in which the fixture is a movable fixture used to position the airfoil in desired positions.

[c13] 13. The apparatus of claim 12 further including a plurality of cameras (I) spaced apart from one another on the same side of the object, each camera obtaining a separate image of the object (P), the respective images being processed using space carving techniques to ascertain the contour of the leading edge (E) of the object whereby an accurate measurement of the leading edge can be made.

[c14] 14. Apparatus for determining the leading edge (E) of an object (P) comprising:
a (B) fixture on which the object (P) is mounted;
a light source (S) positioned on one side of the object (P);
a plurality of cameras (I) positioned on the opposite of the object (P) in a spaced apart relationship for obtaining a respective image of the object (P) and its leading edge (E), the light source (S) illuminating the object which blocks a portion of the light from the light source (S) with the occluded portion of the light defining an outline (T) of the object (P) including its leading edge (E); and,
a processor (R) processing the respective images using space carving techniques to ascertain the contour of the leading edge of the airfoil whereby an accurate measurement of the leading edge of the airfoil can be made.

[c15] 15. The apparatus of claim 14 wherein the processor (R) compares the leading edge measurements of the airfoil (P) with a reference to determine whether or not the airfoil is an acceptable object.